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Haim Niv

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P.O. Box 16446

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EXAMINER

BARKER, MATTHEW M

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/748,822	<b>Applicant(s)</b> NIV, HAIM	
	<b>Examiner</b> MATTHEW M. BARKER	<b>Art Unit</b> 3662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 and 31-72 is/are pending in the application.
- 4a) Of the above claim(s) 4, 12, 14, 15, 25, 31-33, 35, 36, 45-52, 55-58, 68, and 69 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 41-44, 62-64, and 71 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-11, 13, 26-28, 34, 37-40, 53, 54, 59-61, 65-67, 70 and 72 is/are rejected.
- 7) ☒ Claim(s) 16-24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 68 and 69 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention or species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 12/21/2007.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 53, 59, 65, 70, and 72 are rejected under 35 U.S.C. 102(b) as being anticipated by DeBell (5,847,673).

Regarding claims 1, 2, 70, and 72, DeBell discloses a method of obstacle detection for aircraft including transmitting a non- scanning beam that illuminates terrain and obstacles, receiving the claimed Doppler shifted signal from the same antenna (Figure 8), determining the angle between the line of flight and scatterers from the Doppler frequency, determining the range of the scatterers, and determining one of the azimuth, elevation of the scatterers by direction finding, and calculating the other (see Figure 4 and column 3, lines 34-49).

Regarding claim 53, DeBell discloses the claimed apparatus (Figure 5), including a transceiver (30), and claimed processor and computer (40).

Regarding claims 59 and 65, DeBell shows that the beam (50) is pointed substantially along a direction of flight (back to front axis) of the aircraft (See Figure 4).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeBell as applied to claim 2 above, and further in view of Barton (NPL).

DeBell does not explicitly disclose using the claimed off-axis monopulse azimuth estimation scheme, however such a scheme is taught by Barton in the submitted NPL documents (page 421), and described as “old” (page 529). Therefore, it would have been obvious to use the claimed estimation scheme in the method of DeBell in order to achieve conventional advantages such as reduced error with no new or unexpected results.

6. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeBell as applied to claim 1 above, and further in view of Katoh et al. (5,339,085).

Regarding claims 5-8, DeBell does not disclose details of a display, however one of ordinary skill in the art would recognize that the data acquired by DeBell could be visually presented to a user. Katoh discloses a three dimensional terrain map in which

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the backscatter intensity of cells defined by different values of azimuth, elevation, and range is expressed. Katoh also discloses generating and displaying skyline contours based on cells defined by different values of azimuth, elevation, and range, and displaying backscatters that are at a lower elevation and lower range than the skyline (See Figure 6 and column 1, line 39- column 2, line 9). It would have been obvious to modify DeBell to include a display as taught by Katoh in order to provide the operator with a visualization of the surroundings, helping to prevent collision during times of low visibility.

7. Claims 7-8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeBell as applied to claim 1 above, and further in view of Foral (3,369,231).

DeBell does not disclose details of a display, however one of ordinary skill in the art would recognize that the data acquired by DeBell could be visually presented to a user.

Regarding claim 7, Foral discloses an airborne obstacle avoidance system, including generating and displaying skyline contours based on cells defined by different values of azimuth, elevation, and range (See Figure 4 and column 1, lines 13-16).

Regarding claim 8, Foral displays backscatters that are at a lower elevation and lower range than the skyline (See Figures 3-4).

Regarding claim 11, Foral discloses the claimed visual warnings (column 1, lines 39-42).

It would have been obvious to modify DeBell to include a display as taught by Foral in order to provide the operator with a visualization of the surroundings, helping to prevent collision during times of low visibility.

8. Claims 9 and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over DeBell in view of Katoch or Foral as applied to claim 7 above, and further in view of Waruszewski, Jr. (5,086,396).

DeBell as modified does not include the claimed safety circles, however it is well known in the art to include position markings on a aircraft display, as shown by Waruszewski, Jr. (Figure 5 and column 5, lines 28-40). It would have been obvious to further modify DeBell to include markings as taught by Waruszewski, Jr. or obvious variants such as squares or circles in order to help the pilot prevent collision with terrain.

9. Claims 13, 37, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeBell as applied to claim 1 above, and further in view of Boles (4,546,354).

Regarding claim 13, DeBell does not explicitly disclose the claimed use of Doppler filters, however it is well known in the art to use Doppler filters as claimed to determine the Doppler shift and angle, as shown by Boles (column 5, line 1- column 6, line 4).

Regarding claim 37, Boles discloses the claimed summing of Doppler filter results (column 9, lines 5-9). It would have been obvious to include the analysis as

taught by Boles as the method of determining the angle in DeBell in order to achieve conventional advantages with no new or unexpected results.

Regarding claim 38, it would have been obvious to refrain from summing results from sectors closer to the line of flight, as the sectors are already large enough to provide sufficient information to calculate the angle, and further calculation would be wasteful. It is further noted that this practice is disclosed as “well-known” in the present specification (paragraph 0165).

10. Claims 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeBell as applied to claim 1 above, and further in view of Lightfoot (4,746,924).

Regarding claim 26, DeBell does not explicitly disclose the claimed separation of ground reflections from object backscatter. However, it is well known to separate target returns from clutter. This is demonstrated by Lightfoot discloses the claimed Doppler filtering (column 12, lines 48). It would have been obvious to separate ground reflections from object backscatter based on the Doppler shift between the backscatter and ground reflections in order to achieve conventional advantages such as a clutter-free signal with no new or unexpected results.

Regarding claim 28, while neither DeBell nor Lightfoot explicitly disclose pointing a null towards the general direction of the reflection sources, pointing a null to reduce interference is common practice in the art. It would have been obvious to do so in the invention of DeBell as modified in order to achieve conventional advantages with no new or unexpected results.

11. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeBell in view of Lightfoot as applied to claim 26 above, and further in view of Jain et al. (5,608,407).

DeBell as modified does not explicitly disclose the claimed separation of ground and object reflections based on Doppler shift, however this is well known practice in the art, exemplified by Jain (column 3, lines 37-42). It would have been obvious separate ground and object returns in the method of DeBell as modified in order to achieve conventional advantages with no new or unexpected results.

12. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeBell as applied to claim 1 above, and further in view of Zuta (6,278,409).

DeBell does not explicitly disclose wire detection. Zuta discloses a wire detection method for an aircraft, including estimating the horizontal orientation of the wire as the normal to the azimuth to the reflection point (column 7, line 46- column 8, line 58). It would have been obvious to modify DeBell to include wire detection as taught by Zuta in order to aid a pilot in avoiding wires (DeBell column 1, lines 17-39).

13. Claims 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeBell as applied to claim 1 above, and further in view of Kennedy (4,737,788).

Regarding claim 39, Kennedy discloses the claimed detecting of suspended wires based on normal impingement of a beam, and discriminating wires from other objects (See Figure 1, column 5, lines 18-41).

Regarding claim 40, Kennedy discloses that discriminating wires from other objects is based on a discontinuity of backscatter in the elevation plane when no backscatter comes from elevations below the wire's reflection point, as Kennedy only receives returns in the elevation plane (column 1, lines 5-16).

It would have been obvious to modify DeBell to include wire detection as taught by Kennedy in order to aid a pilot in avoiding wires (Kennedy column 1, lines 23-30).

14. Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeBell as applied to claim 53 above, and further in view of Haupt (4,555,706).

DeBell discloses a monopulse radar system but does not explicitly disclose antenna details, specifically that the antenna has a steerable null common to both sum and difference lobes. Haupt discloses the claimed antenna (column 3, lines 4-31). It would have been obvious to use the antenna of Haupt in the system of DeBell in order to achieve reduced interference and improved performance (See Haupt, column 1, lines 31-45).

15. Claims 60-61 and 66-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeBell as applied to claims 1 and 53 above.

DeBell is not concerned with the details of pointing beam 50, and thus does not disclose that the beam is electronically steerable only in a single plane, wherein the single plane is a substantially horizontal plane when the aircraft has substantially a zero roll angle. DeBell does note that while Figure 4 shows the beam (50) pointed to the

ground, Figure 4 applies to any designated range regardless of whether that range coincides with the ground (column 1, lines 47-49). Clearly the invention of DeBell is intended to be used to determine positions of objects in any desired direction. It would have been obvious to one of ordinary skill in the art to electronically steer the beam in only a single plane, wherein the plane is a substantially horizontal plane when the aircraft has substantially a zero roll angle in order to determine positions of and prevent collision with objects representing hazards flying on the same plane as the aircraft.

***Allowable Subject Matter***

16. Claims 16-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. Claims 41-44, 62-64, and 71 are allowed.

***Response to Arguments***

18. Applicant's arguments, see Remarks, filed 9/06/2007, with respect to the 35 U.S.C. § 112, second paragraph and 35 U.S.C. 103(a) rejections based on DeBell in view of Mercer have been fully considered and are persuasive. The rejections have been withdrawn.

However, in view of Applicant's discussion of scanning and steering in the Arguments with respect to the 35 U.S.C. § 112, second paragraph rejection (Remarks, pages 14-15), previous rejections based on DeBell set forth in the non-final office action of 8/10/2006 have been reinstated.

Applicant previously argued in the Remarks filed 1/10/2007 that DeBell must utilize a scanning beam because the beam size is narrow and in the illustration shown in Figure 4, the beam is pointed down and to the side of the aircraft. The Examiner agreed with this assessment because one would assume the beam of DeBell would not permanently stay pointed down and to the side of the aircraft as shown in Figure 4. However, Applicant introduced new claims to indicate that the beam of the claimed invention is steerable. A 35 U.S.C. § 112, second paragraph rejection was applied to these claims, as it was unclear how the antenna beam could be "non-scanning" yet be steered at the same time, especially in light of claims 59, 62, and 65 which indicate the beam is pointed in one particular direction, and Applicants arguments on page 16 of the Remarks filed 1/10/2007 that appear to use the terms "scan" and "steer" interchangeably.

In the Remarks filed 9/06/2007, Applicant has provided definitions and explanations of the intended meaning of the terms "steering" and "scanning". This explanation is acceptable to overcome the 35 U.S.C. § 112, second paragraph rejection. However, taking Applicant's definition of "scanning" as "A periodic motion given to the major lobe of an antenna", the invention of DeBell does in fact use a non-scanning antenna. It is a fundamental benefit of monopulse radar systems such as the system of DeBell over scanning systems that scanning is not required, as a monopulse radar beam operates with its beam in one position to allow continuous tracking of targets in range, avoiding the effects of amplitude scintillation. Also by the provided

definition, the system of DeBell is steerable, as is stated by Applicant on page 1, lines 32 and 34 of the specification.

### ***Conclusion***

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art relates to various radar systems.

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW M. BARKER whose telephone number is (571)272-3103. The examiner can normally be reached on M-F, 8:30 AM-5:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on (571)272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MMB

/Thomas H. Tarcza/  
Supervisory Patent Examiner, Art Unit 3662